

NON-PUBLIC?: N
ACCESSION #: 8712280281

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Calvert Cliffs, Unit 2 PAGE: 1 of 4

DOCKET NUMBER: 05000318

TITLE: Manual Trip as a Result of Two Dropped Control Element Assemblies
EVENT DATE: 11/22/87 LER #: 87-008-00 REPORT DATE: 12/22/87

OPERATING MODE: 1 POWER LEVEL: 80

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: R.L. Wenderlich, General Supervisor-Electrical & Controls
TELEPHONE #: 301-260-4746

COMPONENT FAILURE DESCRIPTION:

CAUSE: X SYSTEM: AA COMPONENT: JS MANUFACTURER: C490

REPORTABLE TO NPRDS: Y

CAUSE: D SYSTEM: AA COMPONENT: ROD MANUFACTURER: C490

REPORTABLE TO NPRDS: Y

CAUSE: X SYSTEM: AA COMPONENT: TMR MANUFACTURER: C490

REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: During performance of the CEA Partial Movement Test (STP-0-29-2), Control Element Assembly 29 (CEA-29), dropped fully into the reactor core and would not raise. During the replacement of the malfunctioning Upper Gripper Power Switch Module for CEA-29, the same module for CEA-28 was removed inadvertently due to personnel error. This removal caused CEA-28 also to drop fully into the reactor core. The reactor was immediately manually tripped due to two dropped CAEs.

Corrective actions are as follows:

1. The electricians invloved were counselled regarding this error. The details of this event have been reviewed with all maintenance electricians.
2. A step-by-step CEA troubleshooting procedure will be written.
3. A mechanical interlock will be added to CEA test compartment door.
4. The CEA number will be added to module description labeling.

5. The malfunctioning gripper module was replaced for CEA-29. The failed module was returned to the manufacturer to determine the root cause of the failure.

(End of Abstract)

TEXT: PAGE: 2 of 4

DESCRIPTION

On November 22, 1987, while at 100% power, during the performance of STP-0-29-2 (CEA Partial Movement Test) by Operations, Control Element Assembly-29 (CEA-29) (EIS-AA-ROD) would not move in or out. On the second attempt to move CEA-29 from the reactor operator's console, CEA-29 dropped fully into the core at 0218. Operations implemented the CEA Malfunctions procedure (AOP-1B) and entered the appropriate Technical Specification Action Statement. The operators commenced reducing Unit 2 reactor power to 75% at 0248.

Electrical Maintenance troubleshooting indicated that no upper gripper low voltage was present for CEA-29. This finding was discussed with the Shift Supervisor and it was agreed to remove the upper gripper power switch module (EIS AA-JS) and timer module (EIS AA-TMR) for CEA-29. Replacement would be with spare modules. The electricians returned to the Control Element Assembly Cabinets (EIS AA-CB) and reverified with Unit 2 control room operators that CEA-29 was on the bottom. One electrician (non-licensed utility person) then loosened the two retaining screws for the rack mounted upper gripper power switch module for CEA-28. This module was located directly above the CEA-29 upper gripper power switch module. He then pulled the module, at which time CEA-28 dropped fully into the core at 0325.

The operators manually tripped the Unit 2 reactor at 0325 in accordance with AOP-1B and carried out Post Trip Immediate Actions (EOP-0) and Reactor Trip (EOP-1). The reactor protective system was manually actuated during this event (reactor trip). ESFAS did not actuate with the exception of AFAS. AFAS was secured after main feedwater flow was verified. Electrical Maintenance returned CEA-28 to service and replaced the modules for CEA-29 from 0630 - 0800. At 0800 start-up was commenced in accordance with Reactor Trip Recovery (AOP-8).

ANALYSIS

Each CEA is controlled by a Coil Power Programmer Cubicle which is approximately a 2' x 2' square with a power/test compartment on top and rack mounted modules on the bottom. These cubicles are stacked four high and side-by-side. The cubicle for CEA-29 was located on the bottom at floor

level, with CEA-28 directly over top of CEA-29. The test compartment door for CEA-29 was open to support troubleshooting. This test compartment door is labeled on the outside surface designating it for CEA-29. Individual rack mounted modules are labeled with noun names describing their function and do not have labels for the designated CEA. The electrician believed that the module he was withdrawing was the correct one for CEA-29. He assumed that the rack mounted modules were located over the power/test compartment door. The actual configuration is the opposite. No troubleshooting procedure currently exists to provide guidance to the electricians when working in the CEA cabinet.

TEXT: PAGE: 3 of 4

Troubleshooting CEA-29 could not determine the root cause of the upper gripper power switch module and timer module failure. These components were replaced and the failed modules have been sent to the manufacturer for further analysis.

The auxiliary feedwater system is actuated by a low steam generator level signal (-170 inches). Although the data does not indicate that the steam generator level fell this low, the auxiliary feedwater system actuated. The operator secured auxiliary feedwater after verifying that main feedwater was available. A time delay feature is scheduled to be installed on AFAS during the 1988 refueling outage.

The initial rod drop occurred while the unit was at 100% power. This is the worst condition for this event as analyzed in Chapter 14.10 of the FSAR. The FSAR analysis assumes that the pressurizer heaters and the charging pumps are not operable which maximizes the effect of the event. In this case, the heaters and charging pumps were operable and continued to operate normally throughout the transient. The second rod drop occurred while the reactor power was being decreased in response to the first rod drop. The second rod drop placed the unit outside the assumptions of the event analysis in the FSAR (assumed only one rod dropped). The reactor was immediately scrammed in accordance with procedures (AOP-1B). Because the off-normal condition was recognized and appropriate action was immediately taken there is minimal safety significance associated with this event. If the second rod drop had occurred with the unit still at 100% power, the consequences of the event would not have been worse because of the immediate corrective action required by the procedures. Additionally, the Technical Specifications would have required immediate boration to compensate for the loss of shutdown margin and the unit to be placed in HOT STANDBY within 6 hours. As an alternative to the Technical Specification requirements, the unit was scrammed. No Technical Specification limits were exceeded. A similar event involving personnel error has occurred previously on Unit 2 and is reported in LER 82-18.

CORRECTIVE ACTIONS

The following corrective actions are being taken to prevent reoccurrence:

1. An interlock on the doors of the power/test compartment will be designed and installed. Unless this door is open the upper screws of the rack mounted modules will not be accessible for module removal.
2. The noun name labeling of the rack mounted modules will be expanded to include CEA number.
3. A CEA troubleshooting procedure will be developed to provide step-by-step guidance and cautions to prevent future personnel errors.

TEXT: PAGE: 4 of 4

4. The failed CEA-29 modules have been sent to the manufacturer to determine the cause of the failure.
5. The electricians involved were counselled regarding this error. The details of the event have been reviewed with all maintenance electricians.

Failed components:

upper gripper power switch module - Combustion Engineering - part number N00045.

1S timer module - Combustion Engineering - part number N00043.

ATTACHMENT # 1 TO ANO # 8712280281 PAGE: 1 of 1

BALTIMORE
GAS AND
ELECTRIC
CHARLES CENTER P.O. BOX 1475 BALTIMORE, MARYLAND 21203

JAMES R. LEMONS
MANAGER
NUCLEAR OPERATIONS DEPARTMENT

December 22, 1987

U. S. Nuclear Regulatory Commission Docket No. 50-318
Document Control Desk License No. DPR 69
Washington, DC 20555

Dear Sirs:

The attached LER 87-008 is being sent to you as required by 10 CFR 50.73.

Should you have any questions regarding this report, we would be pleased to discuss them with you.

Very truly yours,
/s/ J. R. Lemons
J. R. Lemons
Manager - Nuclear Operations Department

JRL:RLW:plv
PSF
cc: William T. Russell
Director, Office of Management Information and Program Control
Messrs: J.A. Tiernan
W.J. Lippold

*** END OF DOCUMENT ***
